HEAT RADIATING UNIT FOR ADAPTER

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(57) ABSTRACT

A heat radiating unit for adapter includes at least one receiving portion and a heat radiating portion. The receiving portion has at least one receiving space for receiving at least one adapter therein. The heat radiating portion includes a plurality of radiating fins, which are extended from an outer surface of the receiving portion in directions opposite to the receiving portion. With the heat radiating unit for adapter, heat produced by an adapter disposed in the receiving space can be transferred to and dissipated from the heat radiating portion to achieve good heat dissipation effect while largely increasing the usable life and power transmission efficiency of the adapter.
HEAT RADIATING UNIT FOR ADAPTER

FIELD OF THE INVENTION

[0001] The present invention relates to a heat radiating unit for adapter, and more particularly to a heat radiating unit for adapter that can effectively dissipate heat produced by an adapter to thereby enable prolonged usable life and upgraded power transmission efficiency of the adapter.

BACKGROUND OF THE INVENTION

[0002] To connect the currently commercially available 3C products, namely, communication, computer, and consumer electronics products, to an external power supply, an adapter is needed in most cases to convert alternating current into direct current for use by the 3C products. When the electric current flows through the adapter, it will cause the metal parts of the electronic elements inside the adapter to produce heat, which will adversely affect the power transmission efficiency of the adapter. A main cause of metal resistance is the energy generated during the directional movement of free electrons under the influence of an external electric field. Due to this energy, the free electrons tend to directly transit to a higher energy level. Electrons at the higher energy level are unstable, they will transit to a lower energy level through electromagnetic radiation, and the directional movement of electrons under the influence of an external electric field is interfered. The energy transferred to the electrons under the influence of the external electric field is radiated, and the electric energy is transformed into heat energy. The higher the temperature of a conductor is, the more free electrons are involved in the electromagnetic radiation. Therefore, the free electrons in direction movement under the influence of the external electric field are apt to transit to a higher energy level and return to the stationary state through electromagnetic radiation. That is why the electrical conductor will have increased resistance when the temperature thereof is increased.

[0003] Therefore, when the heat produced by an adapter is not properly dissipated, the power transmission efficiency and the voltage conversion efficiency of the adapter will be adversely affected.

[0004] In brief, the conventional adapter has the following disadvantages: (1) poor heat dissipating efficiency; (2) low power transmission efficiency; and (3) being subject to easy damage of internal components.

[0005] It is therefore tried by the inventor to develop a heat radiating unit for adapter to overcome the drawbacks of the conventional adapter.

SUMMARY OF THE INVENTION

[0006] A primary object of the present invention is to provide a heat radiating unit for adapter, so that heat produced by an adapter can be effectively dissipated to prolong the usable life of the adapter.

[0007] To achieve the above and other objects, the heat radiating unit for adapter according to the present invention includes at least one receiving portion and a heat radiating portion. The receiving portion has at least one receiving space and at least one recess. The receiving space can receive at least one adapter therein, and the recess is communicating with the receiving space and the heat radiating portion. The heat radiating portion includes a plurality of radiating fins, which are extended from an outer surface of the receiving portion in directions opposite to the receiving portion. A heat-dissipating fluid passage is defined between any two adjacent radiating fins for a heat-dissipating fluid to flow therethrough. A pusher can be movably disposed in the receiving space. The pusher includes at least one adjusting section for adjusting the pusher to a position adapted to firmly press against the adapter disposed in the receiving space. The pusher can be a flat plate, which has a first flat side facing toward the adapter and an opposite second side having the adjusting section connected thereto. The adjusting section includes a rod and an adjusting member. The rod is provided on an outer surface with external threads, and has a first end connected to the pusher and a second end outward extended through the receiving portion and the heat radiating portion. The adjusting member has a second end fitted around the rod and is provided on an inner surface with internal threads to mesh with the external threads on the rod. A first end of the adjusting member is provided with a lip portion for bearing against the heat radiating portion. With the heat radiating unit, heat produced by an adapter disposed in the heat radiating portion can be radiated via the radiating fins to diffuse into ambient environment to achieve the purpose of heat dissipation. Therefore, the adapter can have better electric power transmission efficiency.

[0008] In brief, the heat radiating unit for adapter according to the present invention has the following advantages: (1) extending the usable life of the adapter; and (2) enabling the adapter to have better electric power transmission efficiency.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The structure and the technical means adopted by the present invention to achieve the above and other objects can be best understood by referring to the following detailed description of the preferred embodiments and the accompanying drawings, wherein

[0010] FIG. 1 is a perspective view of a heat radiating unit for adapter according to a first preferred embodiment of the present invention with an adapter separated therefrom;

[0011] FIG. 2 is an assembled view of FIG. 1;

[0012] FIG. 3 is a perspective view of a second embodiment of the heat radiating unit for adapter according to the present invention;

[0013] FIG. 4 is a top view of the heat radiating unit of FIG. 3;

[0014] FIG. 4A is an enlarged view of the circled area in FIG. 4; and

[0015] FIG. 5 is a perspective view of a third embodiment of the heat radiating unit for adapter according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0016] Please refer to FIGS. 1 and 2 that are perspective views of a heat radiating unit for adapter according to a first preferred embodiment of the present invention with an adapter separated therefrom and assembled thereto, respectively. As shown, the heat radiating unit for adapter according to the present invention, which is generally denoted by a reference numeral 1, includes at least one receiving portion 11 and a heat radiating portion 12. The receiving portion 11 has at least one receiving space 111 and at least one recess 112. The recess 112 communicates with the receiving portion 11 and the heat radiating portion 12. The receiving space 111 can receive at least one adapter 2 therein. Transmission cables
on the adapter 2 can be extended through the at least one recess 112 to an environment outside the heat radiating unit 1, so that the adapter 2 can be conveniently disposed in the receiving space 111. The heat radiating portion 12 includes a plurality of radiating fins 121, which are extended from an outer surface of the receiving portion 11 in directions opposite to the receiving portion 11. A heat-dissipating fluid passage 1211 is defined between any two adjacent radiating fins 121, so that convection of a heat-dissipating fluid can occur in the heat-dissipating fluid passages 1211 to effectively diffuse heat produced by the adapter 2 into ambient environment. Therefore, by disposing the adapter 2 in the heat radiating unit 1, the heat produced by the adapter 2 can be transferred to the radiating fins 121 and effectively radiated from the heat radiating unit 1 to diffuse into ambient environment to achieve the effect of heat dissipation. This enables the adapter 2 to transmit electric power with better transmission efficiency without the risk of overheating. Thus, the heat radiating unit 1 according to the present invention not only enables the adapter 2 to have increased power transmission efficiency, but also prolongs the usable life of the adapter 2.

[0017] Please refer to FIGS. 3, 4 and 4A at the same time, in which a second embodiment of the heat radiating unit for adapter according to the present invention is shown. In the second embodiment, the heat radiating unit 1 further includes a pusher 3 movably located in the receiving space 111. The pusher 3 includes at least one adjusting section 31 for adjusting the pusher 3 to a position adapted to firmly press against the adapter 2 disposed in the receiving space 111. The pusher 3 is a flat plate having a first flat side 33 facing toward the adapter 2 and an opposite second side with the adjusting section 31 connected thereto. The adjusting section 31 includes a rod 311 and an adjusting member 312. The rod 311 is provided on an outer surface with external threads 3111, and has a first end connected to the second side of the pusher 3 and a second end outward extended through the receiving portion 11 and the heat radiating portion 12. The adjusting member 312 has a second end, which is fitted around the rod 311 and is provided on an inner surface with internal threads 3112 adapted to mesh with the external threads 3111. A first end of the adjusting member 312 opposite to the second end is provided with a lip portion 32 for bearing against the heat radiating portion 12. With these arrangements, the adapter 2 can be pushed by the pusher 3 to fully contact with the heat radiating unit 1 to avoid the problem of thermal resistance.

[0018] FIG. 5 is a perspective view of a third embodiment of the heat radiating unit for adapter according to the present invention. In the third embodiment, the heat radiating unit 1 includes a first heat radiating portion 13 and a second heat radiating portion 14, both of which consist of a plurality of radiating fins 121. The radiating fins 121 are extended from an outer surface of the receiving portion 11 in directions opposite to the receiving portion 11. And, the first heat radiating portion 13 and the second heat radiating portion 14 are orthogonal to one another.

[0019] The present invention has been described with some preferred embodiments thereof and it is understood that many changes and modifications in the described embodiments can be carried out without departing from the scope and the spirit of the invention that is intended to be limited only by the appended claims.

What is claimed is:
1. A heat radiating unit for adapter, comprising at least one receiving portion and a heat radiating portion; the receiving portion having at least one receiving space for receiving at least one adapter therein; and the heat radiating portion including a plurality of radiating fins, which are extended from an outer surface of the receiving portion in directions opposite to the receiving portion.
2. The radiating unit for adapter as claimed in claim 1, wherein a heat-dissipating fluid passage is defined between any two adjacent ones of the radiating fins.
3. The radiating unit for adapter as claimed in claim 1, further comprising a pusher movably located in the receiving space, the pusher including at least one adjusting section for adjusting the pusher to a position adapted to firmly press against the adapter disposed in the receiving space.
4. The radiating unit for adapter as claimed in claim 3, wherein the pusher is a flat plate having a flat first side facing toward the adapter and an opposite second side with the adjusting section connected thereto.
5. The radiating unit for adapter as claimed in claim 3, wherein the adjusting section includes a rod and an adjusting member; the rod being provided on an outer surface with external threads, and having a first end connected to the second side of the pusher and a second end outward extended through the receiving portion and the heat radiating portion; and the adjusting member having a second end, which is fitted around the rod and is provided on an inner surface with internal threads adapted to mesh with the external threads on the rod.
6. The radiating unit for adapter as claimed in claim 4, wherein the adjusting section includes a rod and an adjusting member; the rod being provided on an outer surface with external threads, and having a first end connected to the second side of the pusher and a second end outward extended through the receiving portion and the heat radiating portion; and the adjusting member having a second end, which is fitted around the rod and is provided on an inner surface with internal threads adapted to mesh with the external threads on the rod.
7. The radiating unit for adapter as claimed in claim 5, wherein the adjusting member has a first end opposite to the second end and provided with a lip portion for bearing against the heat radiating portion.
8. The radiating unit for adapter as claimed in claim 6, wherein the adjusting member has a first end opposite to the second end and provided with a lip portion for bearing against the heat radiating portion.
9. The radiating unit for adapter as claimed in claim 1, wherein the receiving portion further has at least one recess, which is communicating with the receiving portion and the heat radiating portion.

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